

for the mean value 9h. 55m. 35^s., but when the individual observations are compared with it, a well-marked maximum displacement of the centre of the spot, to the amount of 1^h.4, is exhibited, apparently indicating that it gradually oscillated to this extent in longitude, which on the surface of Jupiter corresponds to about 3200 miles. The observations however may be well represented by making the period of rotation a function of the time; thus the period 9h. 55m. 33^s. + 0^h.18s. \sqrt{t} is found to satisfy all the measures with a mean maximum error of 0^h.5: the zero-epoch being September 25, 1879, and t the number of days after that date. The mean-rotation period derived from observations of polar spots is 9h. 55m. 35^s., that deduced from the small spots indicating an average displacement during two months of 2^h, or about 4600 miles. The rotation resulting from the observations of equatorial spots is 9h. 50m. 9^s., with uniform motion. Prof. Hough states that the actual size of the great red spot, as seen with the Chicago telescope (18 $\frac{1}{2}$ inches aperture) is—length, 29,600 miles; breadth, 8300 miles; and he remarks that smaller telescopes make the approximate length considerably less than the real value.

The nebula near Merope in the Pleiades, of which so much has been written, was not seen with the Chicago refractor in 1879, but as so many observers have described it, Prof. Hough, in conjunction with Mr. S. W. Burnham, made a thorough examination of the locality, with the result that they satisfied themselves that "the nebula did not exist, but that the appearance described by different astronomers was wholly an optical illusion, due to the glow from *Merope* and neighbouring stars." This opinion will probably be disputed in many quarters.

THE WASHBURN OBSERVATORY, WISCONSIN.—No. 1 of "Contributions from the Washburn Observatory, of the University of Wisconsin," has been received. The establishment is under the direction of Prof. Edward S. Holden, late of the Naval Observatory, Washington. Work was commenced in the latter part of April in the present year, with the Clark refractor of 15^h.56 inches aperture, and Prof. Holden has had the good fortune to secure the co-operation of that eminent observer, Mr. S. W. Burnham, who left Chicago at the beginning of April to accept a post in Washburn Observatory, and although the publication to which we refer is dated May 31, some five weeks after the commencement of operations, thirty-four new double-stars had been detected and measured by Mr. Burnham, and a number of other doubles, discovered in the course of zone-observations in which Prof. Holden took part, were also measured. In addition we have a list of new nebulae detected in the zone-observations, several of which appear to deserve special attention. On May 2, in R.A. 18h. 8m. N.P.D., 108° 20', a void space was remarked in the Milky Way; it is thus described: "This is a black circular hole (10') in the Milky Way. The stars around it are excessively crowded, and inside there are but two stars, one 10 mag., the other very small."

The number of newly-discovered objects—double stars and nebulae—of which we have the particulars in this first "Contribution" from the Washburn Observatory, is quite extraordinary, considering the few weeks over which observations have extended. We wish continued success to the Observatory of the University of Wisconsin.

SCHAEERLE'S COMET.—The following meridian observations S.P. of Comet c 1881, made with the transit-circle at the Radcliffe Observatory, Oxford, have been communicated by Mr. E. J. Stone, the Radcliffe observer. The N.P.D. is uncorrected for parallax.

| | G.M.T. | | | R.A. | | | N.P.D. | | |
|-------------|--------|----|------|------|----|----|--------|-----|------------|
| | h. | m. | s. | h. | m. | s. | ° | ' | " |
| July 31, | 9 | 54 | 47.5 | ... | 6 | 28 | 21.6 | ... | 44 3 46.1 |
| (a) Aug. 2, | 9 | 56 | 28.0 | ... | 6 | 37 | 55.6 | ... | 42 57 (36) |
| 4, | 9 | 59 | 56.5 | ... | 6 | 49 | 17.7 | ... | 41 47 13.3 |
| 6, | 10 | 6 | 1.3 | ... | 7 | 3 | 16.6 | ... | 40 35 47.9 |
| 10, | 10 | 29 | 50.1 | ... | 7 | 42 | 55.6 | ... | 38 21 31.6 |
| (b) 19, | 12 | 35 | 2.4 | ... | 10 | 23 | 57.4 | ... | 40 44 50.7 |

(a) Comet very faint. Only an approximate observation.

(b) Much brighter. Observation good.

ENCKE'S COMET.—The early observations of this body point to a negative correction of the mean anomaly to the extent of 3', which corresponds to a retardation in the time of perihelion passage of about 0^d.169. The perturbations from the action of Jupiter during the last revolution have been much greater than between 1875 and 1878, in which latter year the necessary

correction to the mean anomaly given by the calculations of the late Dr. von Asten, was about one-third as great, but in the same direction. The work of his successor, Dr. O. Backlund of Pulkowa, has been executed with a most thorough determination of the planetary perturbations, which is extended to the preparation of the ephemeris.

The first glimpse of the comet, so far as we know at present, was obtained by Dr. Hartwig and Prof. Winnecke with the six-inch comet-seeker at the Observatory of Strassburg on August 20. Five days later it was clearly seen in the same instrument as a nebulosity 4' in diameter.

ELONGATIONS OF MIMAS.—The following Greenwich times of apparent preceding elongations of this difficult object depend upon the same elements as previously used in this column:—

| | h. | m. | | h. | m. | | h. | m. |
|----------------|----|----|----------------|----|----|----------------|----|----|
| Sept. 19 at 15 | 36 | | Sept. 21 at 12 | 50 | | Sept. 23 at 10 | 4 | |
| 20 at 14 | 13 | | 22 at 11 | 27 | | 24 at 8 | 41 | |

GEOGRAPHICAL NOTES

THE International Polar Conference, which was held last year at Berne, and the previous year at Hamburg, met last month at St. Petersburg. The object of this Conference is the organisation of a series of stations around the Polar area for the continuous prosecution of scientific observations. Since its last meeting it has lost Lieut. Weyprecht, who was the originator of the idea of such a scheme. Delegates were present from all the leading European States except England, and from the United States of America. The first subject discussed was the time at which observations should be taken, and their frequency. Observations will begin for all the expeditions in the Polar regions, as also for observations in the temperate zones, as soon as possible after August 1, 1882, and will finish as close as possible to September 1, 1883. All the meteorological and magnetical phenomena will be observed hourly during all this time; and, besides, there will be taken on the 1st and 15th of each month magnetic observations every five minutes for twenty-four hours, and every twenty seconds during an hour of the day fixed on in advance, and that everywhere after the mean time of Göttingen. These latter observations have for their special end to obtain a perfect knowledge of perturbations or magnetic storms, and their connection with the aurora borealis. On the basis of a programme of observations to be made, already elaborated by the Hamburg Conference, the obligatory meteorological observations were discussed—*i.e.*, observations which all the stations must make in order to insure the scientific success of the enterprise. The result of the discussion was the fixing of the principles, and in part also of the methods and instruments of observation, to insure the accuracy and comparability of the meteorological observations to be made. Happily the Conference numbers among its members several distinguished men of science, who have acquired in former expeditions in the Polar regions very great experience of the difficulties to be met with in taking observations, who were able to give advice useful in obviating beforehand those obstacles, by the arrangement of the instruments, and by the method of taking observations. One day was devoted by the Conference to visiting the celebrated meteorological and magnetic observatory of Pavlovsk, and discussing there the choice of the best apparatus. The members visited in detail the provisional installations which have been made at the observatory for inspecting the magnetic instruments intended for the Russian expedition to the mouth of the Lena. At the third sitting of the Conference, the magnetic observations were discussed: these also meet with difficulties unknown in temperate zones. It is not only the great cold, but also the feebleness of the horizontal intensity of terrestrial magnetism, as also the frequency and greatness of the perturbations, which render observations very difficult and delicate. At the fourth meeting the Conference was occupied with observations on the aurora borealis, and with the question of facultative observations, those which are recommended to the expeditions, without being considered indispensable—as observations on the temperature of the soil, evaporation, terrestrial galvanic currents, atmospheric electricity, &c. The conference, among other things, decided to apply to different institutes to assure their co-operation, and to request magnetic observatories in the temperate zones, especially those in the southern hemisphere, to participate in the simultaneous observations, as also to ask the directors of the telegraphs of different countries to study more accurately terrestrial

galvanic currents in the telegraphic wires when aurora borealis or magnetic perturbations appear. Finally the assembly unanimously approved three proposals by Count Wilczek:—1. To found, if possible, a special publication to convey more quickly to the knowledge of the scientific world, as well as to the leaders of the expeditions, the proposals and reports concerning the expeditions, as also their first results. 2. To leave, if possible, on the spot the buildings and other arrangements likely to be useful to future expeditions of the same kind, and to recommend them in each country to the care of navigators or of the inhabitants. 3. To ask railway and steamboat companies to grant a reduction in the fares for the staff and effects of the various international Polar expeditions. The stations proposed, we may state, are two on the north coast of Siberia, one in Novaya Zemlya, one in Spitzbergen, one on Jan Mayen Island, one on the west coast of Greenland, one at Lady Franklin Bay, one in the Behring's Strait region, and the participating countries are Russia, Sweden, Denmark, Germany, Austria, and the United States.

ON the 3rd of next month the members of the Italian scientific expedition for the exploration of the Arctic Seas will embark at Genoa in one of Lovarello's steamers. The zoology will be under the care of Dr. Vinciguerra; the botany will be confided to Dr. Lorenzo, at present residing at Buenos Ayres; mineralogy and geology to Prof. Lovisato, of the University of Sassari; and to Lieut. Roneagli the artistic department is given, for which purpose he will take photographic apparatus, &c. At Buenos Ayres the Commission will embark on a vessel belonging to the Argentine Republic. Lieut. Bove, who will take the command of the expedition, has already left for Buenos Ayres.

THE U.S. Government have been officially advised of the arrival of Lieut. Greeley's Polar Expedition at Lady Franklin Bay, six days after leaving Upernivik. The expedition entered Discovery Harbour on August 11, where a station was formed. The party were all well and plentifully provided.

ADVICES from Copenhagen state that the news received from the Dutch Polar Expedition on board the schooner *Willem Barents* is very unfavourable. Owing to the continuous ice barrier, which extends nearly to Norway, Spitzbergen could not be reached, nor yet even the Bear Islands; and after one more attempt to force through northward, the expedition will return home, as the captain is convinced that this year Novaya Zemlya is completely inclosed in a barrier of ice.

THE Russian Geographical Society has prepared short notices on the progress of different branches of geographical science from 1875 to 1881, *i.e.* from the second to the third Geographical Congress. Three of them are printed: (1) "Aperçu des Travaux Hydrographiques"; (2) M. Bogdanow: "Aperçu des Recherches Zoo-géographiques en Russie"; (3) P. Matveiev and A. Stichin-ky: "Aperçu des Études sur le Droit coutumier en Russie." Besides there are in preparation notices on botanical geography by M. Bataline, on geology by M. Alénitzin, and on Count Uvarow's work on the Stone Age in Russia, by L. Maikof. A. W. Grigorief and Dr. A. Woeikof will be the Russian official delegates to the third Geographical Congress. The absence of the celebrated Russian cartographers is much to be regretted; one of them, General Stubendorff, hoped to attend the Congress, but now it is known he will not be present.

THE new number of the Geographical Society's *Proceedings* is remarkable for the excellent map of Khorasan and the neighbouring countries, in illustration of Col. Stewart's account of his journey and investigations in the Tekke Turkoman country and the region of the Tejend and Murghab Rivers. The map goes beyond Merv and Herat on the east and takes in the south-east part of the Caspian on the west. There is also an article on the recent journey of two Baptist missionaries from Vivi, by the north bank of the Congo, to Stanley Pool. Dr. Matteucci's great geographical achievement in North Central Africa and subsequent death in London are sympathetically referred to in the Geographical Notes. The Society's telegram of condolence to the Geographical Society at Rome appears to have been much appreciated there, as it has been reproduced in the Italian papers. One of the most interesting items in the present number is a letter from Mr. W. H. Dall, of the United States Coast Survey, on "The Chukches and their Neighbours in the North-Eastern Extremity of Siberia." The letter is written in reply to some strictures which Lieut. Nordqvist, of the *Vega*, addressed

to the St. Petersburg Geographical Society, and which were noticed in the *Proceedings* for June.

THE Berlin African Society has received further news from several German explorers in Western Africa. Dr. Pogge and Lieut. Wissmann were at Malange at the end of May, hoping to start early in June, and to reach Kimbundo at the end of that month. From Robert Flegel news are to hand up to June 4. The members of the station at Kokoma are occupied with scientific collections and the exploration of the environs. Dr. Stecker is trying to reach the Central African lakes from Abyssinia.

A NEW volume of travels by Mr. E. A. Floyer, F.R.G.S., &c., entitled "Unexplored Baluchistan, a Survey of a Route through Western Baluchistan, Mekran, Bashakird, Persia, Kurdistan, and Turkey," will be published during the autumn by Messrs. Griffith and Farran. Mr. Floyer was the first to explore the wild district of Bashakird; he contributed a paper on that little-known country to the Plymouth meeting of the British Association. Besides the narrative, which is full of interesting personal incident and adventure, the work will contain original illustrations, a map, vocabularies of dialects, lists of plants collected and tabulated, and observations, astronomical and meteorological.

PROF. SIMONY has published a list of the greatest depths of various Alpine lakes, which may interest our readers: Gmunden Lake, 191, Hallstadt Lake 125, Attersee 171, Mondsee 67, Wolfgang Lake 114, Achensee 132, Königssee 188, Lake of Constance 276, Chiemsee 89, Starnberg Lake 131, Lake Lemau 309, Neufchâtel Lake 144 metres. The last-named four measures 92, 57, 589, and 240 square kilometres surface. The greatest depth of the northern part of the Adriatic is only 243 metres.

SCIENTIFIC SERIALS

The Journal of the Royal Microscopical Society, August, 1881, contains:—On some remarkable enlargements of the axial canals of sponge spicules and their causes, by Prof. P. Martin Duncan (plates 7 and 8).—On a blue and scarlet double stain, suitable for nerve and other animal tissues, by Dr. B. Wells Richardson. With the summary of recent researches, zoology, and botany, pp. 575 to 651; Microscopy, pp. 651-711.—*Proceedings of the Society for June*.

The American Naturalist for August, 1881, contains: The great crested fly-catcher, by Mrs. Mary Treat.—On the reasoning faculty of animals, by Joseph F. James.—On the progress of anthropology in America during 1880, by O. T. Mason.—On the manuscript Troana, by Cyrus Thomas.—The Editor's Table.—Some recent literature.—General notes and scientific news.

Proceedings of the Academy of Natural Sciences of Philadelphia, Part I, January to May, 1881, contains: Dr. Jos. Leidy, Rhizopods as food for young fishes.—Thomas Meehan, note on treeless prairies; motility in plants; sexual characters in *Fritillaria atropurpurea*, Nutt.—R. Arango, descriptions of new species of terrestrial mollusca of Cuba.—Rev. H. C. McCook, on the honey-ants of the Garden of the Gods. (This detailed memoir on the structure and habits of *Myrmecocystes melliger* is illustrated with ten plates.)—John A. Ryder, on the structure, affinities, and species of *Scolopendrella*. *S. gratia* is figured and described. An American specimen of what is presumed to be *S. notacantha* is also figured. The author places these strange insects in an order Symphyla, indicating that it has affinities to Thysanura; trachea are present. Henry Hemphell, on the variations of *Acmaea pelta*.—R. E. C. Stearns, observations on Planorbis (with many woodcuts).

American Journal of Science, August.—Method of obtaining and measuring very high vacua with a modified form of Sprengel pump, by O. N. Rood.—Geological relations of the limestone belts of Westchester county, New York; origin of the rocks of the Cortlandt series, by J. D. Dana.—New meteoric iron of unknown locality, in the Smithsonian Museum, by C. U. Shepard.—The relative motion of the earth and the luminiferous ether, by A. A. Michelson.—Observations on the light of telescopes used as night-glasses, by E. S. Holden.—Nature of dictyophyton, by C. P. Whitfield.—Observations on the comet, by H. Draper, C. A. Young, W. Harkness, L. Boss, and A. W. Wright.